DOE/WIPP-95-2125 REV. 4

WASTE ISOLATION PILOT PLANT TECHNICAL SAFETY REQUIREMENTS

December 1999

Prepared for
United States Department of Energy

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TECHNICAL SAFETY REQUIREMENTS

1 Use and Application

This document provides the WIPP Technical Safety Requirements (TSR), in accordance with the requirements of DOE Order 5480.22, *Technical Safety Requirements*.[1] DOE Order 5480.22[1] provides detailed criteria for the selection of TSR Safety Limits (SLs), Limiting Control Settings (LCSs), Limiting Conditions for Operations (LCOs), Surveillance Requirements (SRs), and Administrative Controls (ACs).

Based on the WIPP Safety Analysis Report (SAR)[2] Chapter 5, Hazards and Accident Analyses, SLs, LCSs, LCOs, and SRs are not required for the WIPP facility as discussed below. As discussed in SAR[2] Chapter 5, Design Class I Systems, Structures or Components (SSCs) are not required for the WIPP to mitigate any accidental radiological and non-radiological Maximally Exposed Individual (MEI) and noninvolved worker consequences to acceptable levels. WIPP TSR in the form of ACs are derived in SAR[2] Chapter 6. These ACs provide TSR covering the WIPP defense-in-depth approach developed in SAR[2] Chapter 5.

1.1 Definitions

----------NOTE----------

The definitions provided in this section are specifically applicable to the TSR, and they are displayed in all capital letters throughout this TSR Document. Also, some definitions refer the reader to a specific section of this document to help provide a more complete description than can be provided in a summarized definition read out of context.

Term	Definition
MODE	A MODE of operation defines the operating condition of the WIPP facility at a given time. See Section 1.2, MODES.
OPERATIONAL LIMITS	Those limits that are required to ensure the safe operation of a nuclear facility. Specifically, these limits include LCSs and LCOs.
TECHNICAL SAFETY REQUIREMENTS	TSR are those requirements that define the conditions, safe boundaries, and the management or administrative controls necessary to ensure the safe operation of a nuclear facility and that reduce the potential risk to the public and facility workers from uncontrolled releases of radioactive materials or from radiation exposures due to inadvertent criticality. TSR consist of safety limits, OPERATIONAL LIMITS, surveillance requirements, administrative controls, use and application instructions, and the basis thereof.
VIOLATION	See Section 5.7, TSR VIOLATIONS.
WASTE	Contact-Handled (CH) Transuranic (TRU) WASTE materials being received, handled and disposed in WIPP-approved CH containers. Site derived mixed waste is also considered in this definition when it is handled in containers or cleaned up following a breach in a container.

WASTE HANDLING	Activities occurring when actual WASTE is being unloaded (including opening or closing a loaded TRUPACT-II), transported (outside of TRUPACT-IIs), and emplaced. The following similar activities are not considered WASTE HANDLING activities, and do not present the level of hazard requiring the protections afforded the handling of WASTE; storing or inspecting WASTE in the WHB or the Underground, moving closed TRUPACT-IIs, TRUPACT-II maintenance, or the preparation of empty TRUPACT-IIs for shipment to generator sites.
WASTE STORAGE/ DISPOSAL	For the purposes of these TECHNICAL SAFETY REQUIREMENTS, with regard to transuranic waste: the term "STORAGE" refers to the temporary storage of that waste above ground; and, the term "DISPOSAL" refers to that waste which has been emplaced in the underground horizon.

1.2 Facility MODES

Operations at the WIPP consist of WASTE HANDLING, storage, and disposal operations. The following is a definition of the MODES of operations. The MODE is defined such that the Waste Handling Building and the Underground may be in different MODES. Defense-In-Depth SSCs are operated as required in each MODE as specified in Section 5. The facility will always be in the WASTE STORAGE/DISPOSAL MODE or WASTE HANDLING MODE as described below.

1.2.1 WASTE HANDLING MODE

The Waste Handling Building (WHB) and/or the Underground is configured for WASTE HANDLING, and all required Defense-In Depth SSCs are operated as required in Table 5-1. Maintenance, repair activities, and inspections are allowed as long as they do not prevent the functions of the Defense-In Depth SSCs required for the WASTE HANDLING MODE.

1.2.2 WASTE STORAGE/DISPOSAL MODE

WASTE HANDLING operations are not being conducted in the WHB and/or in the Underground. WHB and/or the Underground is configured for WASTE STORAGE/DISPOSAL MODE, and required Defense-In-Depth SSCs are operated as required in Table 5-1. No WASTE HANDLING operations are allowed during WASTE STORAGE/DISPOSAL MODE, except as required to provide orderly transition, according to procedure, from WASTE HANDLING MODE. Maintenance, repair activities, and inspections are allowed, provided the Defense-In-Depth SSCs required for the MODE are restored in a timely manner, and Defense-In-Depth SSCs are not intentionally removed from service during the WASTE HANDLING completion allowed above.

1.3 Safety Limits (SLs)

As defined in DOE Order 5480.22,[1] SLs are limits on process variables associated with those physical barriers, generally passive, that are necessary for the intended facility function, and that are found to be required to guard against the uncontrolled release of radioactivity and other hazardous material. "Process Variables" refers to observable, measurable parameters such as temperature and pressure. "Passive physical barriers" refers to those barriers that constitute the primary process material boundary.

Based on the analysis presented in SAR[2] Chapter 5, no SLs are identified for the WIPP facility.

1.4 Limiting Control Settings (LCSs)

As defined in DOE Order 5480.22,[1] LCSs are settings on safety systems that control process variables to prevent exceeding SLs. More precisely, an LCS is the set point for an instrument or device monitoring a process variable that, if exceeded, initiates actions to prevent exceeding an SL.

The WIPP facility has no SLs identified, therefore, no LCSs are required.

1.5 Limiting Conditions for Operations (LCOs)

DOE Order 5480.22,[1] Attachment 1, Section II.2.3.h, provides that "LCOs should be written only for systems and equipment which meet one (or more) of the following descriptions," and prescribes five selection criteria, h.(1) through h.(5). The order also emphasizes that "Maintaining the LCOs at the minimum number necessary will emphasize the importance of the LCOs and better ensure the compliance with them." All five criteria clearly tie the LCOs to the facility accident or transient analyses.

The LCO selection criteria interpretations define TSR content based on key nuclear safety analysis requirements. Specifically, three of the five TSR LCO selection criteria are understood to restrict TSR LCOs to only those requirements that are under the direct control of the facility's operators and are of primary importance for: **prevention** (Criterion h.(1)), **mitigation** (Criterion h.(2)), and **initial conditions** (Criterion h.(3)) of credible, unmitigated accident scenarios. Additionally, Criterion h.(4) involves the application of criteria h.(1), h.(2), and h.(3) to experiments and experimental facilities, and Criterion h.(5) to systems and equipment that are used for handling fissile material.

The specifics of each criterion as applied to the WIPP facility are as follows:

Criterion h.(1) - Prevention:

A basic concept in the protection of the public is the prevention of accidents that have the potential for an uncontrolled release of radioactive material. Criterion h.(1) is intended to ensure that TSR be selected to identify instrumentation that is used to detect, and to indicate in the control room or other control location, a significant degradation of the physical barriers which prevent the uncontrolled release of radioactive or other hazardous materials. For example, instrumentation installed to detect significant degradation of a reactor coolant pressure boundary enables the operator to correct the degraded condition prior to accident initiation or to place the facility in a condition that reduces the likelihood of the accident.

WIPP instrumentation, such as the Continuous Air Monitors (CAMs), Effluent Monitors, Area Radiation Monitors (ARMs), and installed instrumentation to control differential pressure, are not required to prevent accidents as analyzed in the SAR[2] from occurring, or to facilitate the Central Monitoring Room (CMR) operator placing the facility in a condition reducing the likelihood of an accident from occurring. Therefore, Criterion h.(1) has no application to the WIPP.

Criterion h.(2) - Mitigation:

Criterion h.(2) provides that "Structures, systems, and components that are relied upon in the Safety Analyses to function or actuate to prevent or mitigate accidents, or transients that either involve the assumed failure of, or present a challenge to, the integrity of a physical barrier that prevents the uncontrolled release of radioactive materials … intended to include only those structures, systems, and components that are part of the primary success path of a safety sequence analysis and those support and actuation systems necessary for them to function successfully."

The "primary success path of a safety sequence analysis" is defined as "the sequence of events assumed by the Safety Analyses, which leads to the conclusion of a transient or accident with consequences that are acceptable. Hence, any structure, system, or component in that assumed sequence should be included in the LCO."

Consistent with the primary intent of DOE Order 5480.22[1] establishing requirements for the protection of the public, the existing practice is: 1) to evaluate the unmitigated radiological and non-radiological consequences to members of the MEI and noninvolved worker as the result of an accident, 2) to compare the radiological and non-radiological consequences to established accident risk evaluation guidelines, and 3) if the consequences of the accident exceed the established accident consequence risk evaluation guidelines, to define SSCs and associated TSR LCOs mitigating or reducing those consequences to acceptable levels below the established criteria.

The unmitigated MEI and noninvolved worker radiological and non-radiological consequences and risk evaluation guidelines, as documented in Chapter 5, Tables 5.2-3, and 5.2-4., are used as the basis for applying this criterion.

Application of DOE Order 5480.22[1] TSR LCO Selection Criterion h.(2) to the WIPP:

The WIPP SSCs that are assumed to function in the SAR accident analysis mitigating an accident's radiological and non-radiological consequences to acceptable levels (to within the accident risk evaluation guidelines) satisfy Criterion h.(2).

The unmitigated radiological and non-radiological accident consequences were estimated and compared to the risk evaluation guidelines in Chapter 5. The unmitigated radiological and non-radiological accident consequences are below the consequence risk evaluation guidelines therefore; 1) mitigating SSCs are not required, and 2) TSR LCOs are not required. Tables 5.2-3 and 5.2-4 of Chapter 5 of the SAR list the analyzed accidents and the mitigated and unmitigated MEI and noninvolved worker radiological consequences. All of the radiological and non-radiological accident consequences are well below the applicable risk evaluation guidelines.

Criterion h.(3) - Initial Condition:

Process variables as initial conditions of accidents, or transients that are monitored and controlled during operations so the parameter remains within the analysis bounds, satisfy this selection criterion. The WIPP is not a process facility, therefore process variables are not considered in the SAR[2] accident analysis as initial conditions for accidents. Thus, Criterion h.(3) is not applicable to the WIPP.

Criterion h.(4)

Criterion h.(4) involves applying criteria h.(1), h.(2), and h.(3) to experimental activities involving radioactive or other hazardous materials. There are currently no planned experimental or test activities at the WIPP. Therefore, Criterion h.(4) is not applicable to the WIPP.

Criterion h.(5)

Criterion h.(5) applies to fissile material handling facilities, and is only related to inadvertent criticality protection. Inadvertent criticality is not a credible hazard at the WIPP. Inadvertent criticality is controlled through the ACs Criticality Program in conjunction with the WASTE Characteristics program which conforms to the WIPP Waste Acceptance Criteria (WAC).[3] Therefore, Criterion h.(5) is not applicable to the WIPP.

1.6 Surveillance Requirements (SRs)

As defined in DOE Order 5480.22,[1] SRs relate to testing, channel calibration, channel operational testing, or inspection to maintain the operability, quality, and safety of SSCs, and their support systems. SRs are defined as the requirements necessary to maintain facility operation within the SLs, LCSs, and LCOs. Selection criteria for SRs are defined in DOE Order 5480.22.[1] Without SLs, LCSs, and LCOs for the WIPP facility, SRs are not required.

1.7 Administrative Controls (ACs)

As discussed in Section 2.4 of Attachment 1 of DOE Order 5480.22,[1] ACs impose necessary requirements controlling operation of the facility to meet all TSR requirements. Without SLs, LCSs, LCOs, and SRs, WIPP specific ACs impose administrative and operational requirements supporting the WIPP defense-in-depth concept.

Supporting the first layer of defense-in-depth (the prevention of accidents) as defined in SAR[2] Section 5.1.6, WIPP TSR ACs are established as follows:

- To maintain the design, quality, testability, inspectability, operational capability, maintainability, and accessibility of the facility, TSR ACs are required relating to: (1) configuration and document control, (2) maintenance, (3) quality assurance, and (4) geotechnical monitoring. These ACs are important to ensure the frequency of events and the availability of the operational and design conditions remain as analyzed in SAR Section 5.2.3.

- To ensure that the facility operations are conducted by trained and certified/qualified personnel in a controlled and planned manner, TSR ACs are required relating to: (1) facility operations chain of command and responsibilities, (2) facility staffing requirements, (3) procedures, (4) staff qualifications, (5) conduct of operations, and (6) training. These ACs are important to ensure the low frequency of the accidents analyzed in SAR Section 5.2.3, in particular to those WASTE handling accidents where human error is the major contributor to the likelihood of the accident initiating event (CH3, CH4, and CH9).

- To ensure that hazards are limited within the bounds assumed in Chapter 5.2, or that the occurrence of a deviation from the assumed hazard bounds are at an acceptably low frequency, TSR ACs are required relating to: (1) WASTE characteristics (Waste Acceptance Criteria), (2) WASTE container integrity, and (3) criticality safety. The TSR AC for WASTE characteristics

limits the radionuclide content of each WASTE container, restricts the fissile content of the containers, and restricts the presence of WASTE characteristics unacceptable for management at the WIPP facility. Container integrity ensures the robustness reflected in the WASTE release analyses, while criticality safety is a designed in-storage and handling configuration that ensures (in conjunction with WASTE characteristics) that active criticality control is not required.

Supporting the second and third layers of defense-in-depth, WIPP TSR ACs are identified which establish programs for radiation protection (including radiation monitoring equipment and airborne radioactivity monitoring), and mitigation of off-normal events through emergency management.

Consistent with the discussion in SAR Section 5.1.8, specific SSCs that fulfill a defense-in-depth safety function important to accident scenarios, or considered essential for WASTE HANDLING, storage and/or disposal operations are as follows: (1) Waste Handling Building (WHB) Heating, Ventilation and Air Conditioning (HVAC) and Underground Ventilation and Filtration Systems (UVFS) (including underground shift to filtration and excluding RH area ventilation; unless the RH area is used for CH storage or handling); (2) Waste Hoist Equipment (including Brake System); (3) WASTE Handling Equipment (including the TRUDOCK Bridge Crane, forklifts, transporters, etc.); (4) WHB structure including tornado doors; (5) Central Monitoring System (to support underground shift to filtration only); and (6) Radiation Monitoring System, active waste disposal room exit alpha CAM (for underground shift to filtration). The applicability of the important defense-in-depth SSCs to each accident, analyzed in SAR Section 5.2.3, is listed in SAR Table 6-1. The above SSCs are classified as "Defense-In-Depth SSCs."

As shown in Section 1.5, based on the criteria for assigning Technical Safety Requirement (TSR) Limiting Conditions for Operation (LCOs), defense-in-depth SSCs are not assigned TSR LCOs. The facility has no complex system requirements to maintain an acceptable level of risk. The WIPP Waste Acceptance Criteria for transuranic WASTE and the design of the WASTE handling process and its supporting facilities provide assurance that the immediate consequences of an accident will be limited and allow the WIPP facility to isolate and contain releases while maintaining a high assurance that no additional releases will occur. The facility is designed to minimize the presence and impact of other energy sources that could provide the heat or driving force to disperse hazardous materials. The magnitude of hazardous materials that can be involved in an accident leading to a release is very limited. The radioactive material is delivered to the site in sealed containers, and the WASTE HANDLING operations are designed to maintain that integrity throughout the entire process required to safely emplace those containers in the site's underground WASTE disposal rooms. Inventory limits on individual containers ensure that heat generated by radioactive decay can be easily dissipated by passive mechanisms. Finally, only a limited number of WASTE containers have the possibility of being breached as a result of any one accident initiating event. As a result, the consequences of unmitigated releases from all accidents hypothesized in Chapter 5, including those initiated by human error, do not produce significant offsite health consequences.

When something unusual happens during normal operations (such as defense-in-depth SSCs becoming unavailable), **WASTE HANDLING can be simply stopped** until an acceptable condition is reestablished. The facility is designed to minimize the presence and impact of other energy sources that could provide the heat or driving force to disperse hazardous materials. Should an accident involving the breach of a container occur, **the plant design permits the immediate cessation of activity and isolation of the area where the breach occurs**. Once isolation is achieved, there is no driving force within the WASTE or WASTE HANDLING area that could result in a further release of the WASTE material. The absence of energy sources that can disperse the radioactive WASTE allows the immediate termination of all activities, evacuation of personnel, and isolation of the area without

the threat of additional consequences. This will enable WIPP personnel to then proceed with detailed planning to meet the unique circumstances of any accidental release prior to initiating decontamination and the execution of recovery actions, while assuring that the health and safety of both workers and the public is protected. The controls necessary to maintain safety during the recovery and cleanup can be documented in the recovery plans, its associated Radiological Work Permit, and the USQ process. In order to ensure protection by the identified SSCs during recovery from an event that breaches a WASTE container, the Defense-In-Depth SSCs for the WASTE HANDLING MODE will be required during the period of time that WASTE may be exposed.

Based on the above discussion, specific functional requirements are not assigned here for the Defense-In-Depth SSCs, rather, the SSCs shall be operated, as required during the applicable WIPP MODE of operation defined in the next sections. Detailed design descriptions for the Defense-In-Depth Equipment may be found in Chapter 4 and the applicable Systems Design Descriptions.

Due to the importance of the Defense-In-Depth SSCs in the WIPP defense-in-depth strategy and worker protection from accidents, TSR ACs are assigned in SAR Chapter 6 and required in this WIPP TSR Document, requiring the Defense-In-Depth SSCs to be operated as required when WASTE HANDLING operations are being conducted (to enter the WASTE HANDLING MODE in the WHB or the Underground).

The Defense-In-Depth SSCs operational requirements ensure that important defense-in-depth SSCs are operated as required during WASTE HANDLING operations in the Surface or Underground WASTE HANDLING MODES, to provide protection for the “most likely” WASTE HANDLING accidents identified in SAR Section 5.2.3: (1) CH2, Crane Failure in the Waste Handling Building (WHB), (2) CH3, Puncture of Waste Containers in the Waste Handling Building, (3) CH4, Drum Drop in WHB, and (4) CH9, Drum Drop in the Underground); for natural phenomenon events: (1) CH6, Design Basis Earthquake, and CH10, Design Basis Tornado; and for less likely operational accidents identified in SAR Section 5.2.3: (1) CH1, Spontaneous Ignition in a Drum in the WHB, (2) CH5, Waste Hoist Failure, (3) CH7, Spontaneous Ignition in a Drum in the Underground, and (4) CH11, Roof Fall.

As discussed above, if any of the Defense-In-Depth SSCs fail to operate (when required), or becomes unavailable during WASTE HANDLING operations, WASTE HANDLING operations shall be stopped, and the facility shall be placed in the WASTE STORAGE/DISPOSAL MODE. WASTE HANDLING operations shall not resume until the above Defense-In-Depth SSCs are capable of being operated, as required.

During WASTE STORAGE/DISPOSAL MODE in the WHB, the above Defense-In-Depth SSCs operational requirements ensure that important defense-in-depth SSCs are operated as required during temporary storage operations (for WASTE temporarily stored in the WHB prior to transfer to the underground) to provide protection for less likely operational accidents evaluated in SAR Section 5.2.3: (1)CH1, Spontaneous Ignition in a Drum in the WHB; and for natural phenomenon events: (1) CH6, Design Basis Earthquake, and CH10, Design Basis Tornado.

During WASTE STORAGE/DISPOSAL MODE in the Underground, the above Defense-In-Depth SSCs operational requirements ensure that important defense-in-depth SSCs are operated as required (for WASTE disposed in the underground), to provide protection for less likely operational accidents evaluated in SAR Section 5.2.3: (1) CH7, Spontaneous Ignition in a Drum in the Underground, and (2) CH11, Roof Fall.

For the WASTE STORAGE/DISPOSAL MODE, if any of the required Defense-In-Depth SSCs fail to operate (when required) or become unavailable, no specific actions are identified, other than to perform corrective maintenance on the affected equipment in a timely manner.

A summary of the applicability of defense-in-depth SSCs in relation to the MODE definitions is presented in Table 5-1.

2 Safety Limits

No SLs are defined for the WIPP facility.

3/4 OPERATIONAL LIMITS and Surveillance Requirements

No LCSs or LCOs are defined for the WIPP facility.

Because no OPERATIONAL LIMITS have been defined for the WIPP facility, no SRs are needed.

5 Administrative Controls

5.1 Defense-In-Depth SSC Operation

Defense-in-depth SSCs are listed in WIPP Safety Analysis Report,[2] Chapter 6, Table 6-1. The applicable System Design Descriptions define defense-in-depth SSCs, describe their intended safety functions, and specify the requirements for design, operation, maintenance, testing, and calibration. WP 04-AD3001, Facility Mode Compliance, shall be implemented, and maintained to ensure that defense-in-depth SSCs are operated as required during each facility mode as described in Table 5-1.

5.2 Facility Operations Chain of Command and Responsibilities

Facility Manager (FM)

The FM shall be responsible for overall WIPP facility operation. The FM shall delegate in writing the succession to this responsibility during his/her absence. The Manager of the Operations Department of the Management and Operations Contractor (MOC) is the FM for the WIPP facility operation.

The Operations Department section managers are responsible for reporting plant status to the FM, and resolving issues as they arise.

Facility Shift Manager (FSM)

The FSM shall be responsible for operation of facility equipment and systems during normal and emergency situations. The FSM directs shift personnel through approved plans, procedures, and instructions. The FSM is the senior manager on shift during periods other than normal working hours, and reports to the FM through the organizational structure.

5.3 Facility Staffing Requirements

The MOC organizational structure, responsibilities, and staffing qualifications are described in Chapter 8 of the SAR.[2] The minimum required operating staff to maintain the facility in a safe condition is specified below. The minimums are based on conducting WASTE HANDLING operations in series (e.g., completing surface WASTE HANDLING activities before beginning underground WASTE HANDLING activities) from a single TRUDOCK position. The personnel performing surface WASTE HANDLING activities may perform underground WASTE HANDLING activities providing surface WASTE HANDLING activities are completed. When parallel WASTE HANDLING activities are occurring at two or more TRUDOCK positions, additional staff is required to provide the minimum concurrent coverage for surface and underground WASTE HANDLING activities. In addition to the minimum operating staff, adequate staffing will be available to implement and maintain the TSR ACs.

5.3.1 WASTE STORAGE/DISPOSAL MODE Staffing Requirements

Facility Shift Manager (FSM)

Central Monitoring Room Operator (CMRO)

Surface Roving Watch

One of the following personnel;

Emergency Services Technician (EST), or

Fire Protection Technician (FPT)

The EST/FPT may be temporarily absent from the facility as part of required emergency response actions or as part of normal duties (e.g. taking the ambulance for required drive on a daily basis) without a TSR VIOLATION.

5.3.2 WASTE HANDLING MODE Staffing Requirements

After initiation of the WASTE HANDLING MODE, required personnel (over and above those required for WASTE STORAGE/DISPOSAL MODE) will only be necessary during actual WASTE HANDLING. These are facility staffing requirements and only need to be present in the WHB as required for the WASTE HANDLING MODE. Planned breaks do not constitute a TSR VIOLATION.

5.3.2.1 Staffing Requirements for WASTE HANDLING MODE in the WHB

Staffing requirements from WASTE STORAGE/DISPOSAL MODE plus:

WASTE HANDLING Engineer

Radiological Control Technician (one per TRUDOCK position in operation)

Radiological Control Air Monitoring Technician (rover)

WASTE HANDLING Technician (one per TRUDOCK position in operation)

WASTE HANDLING Technician (one per TRUDOCK crane in operation)

During WASTE HANDLING not involving the TRUDOCK, there shall be at least one WASTE HANDLING Technician, one WASTE HANDLING Engineer, and one Radiological Control Technician present.

During WASTE HANDLING involving the TRUDOCK, the WASTE HANDLING Engineer can simultaneously serve in the capacity of a WASTE HANDLING Technician.

5.3.2.2 Staffing Requirements for WASTE HANDLING MODE in the Underground

Staffing requirements from WASTE STORAGE/DISPOSAL MODE plus:

WASTE HANDLING Engineer

Radiological Control Technician (one for each WASTE HANDLING area)

WASTE HANDLING Technician (two for each underground transporter in operation). When handling WASTE in the underground without the involvement of the Transporter, there shall be at least one WASTE HANDLING Technician.

During WASTE HANDLING involving the Transporter, the WASTE HANDLING Engineer can simultaneously serve in the capacity of a WASTE HANDLING Technician.

Underground Facility Operations Engineer

Underground Roving Watch

Radiological Control Air Monitoring Technician Rover (performed at surface, only one required for WASTE HANDLING in either area).

5.4 Facility Staff Qualifications

Each member of the WIPP facility operation staff and technical support personnel shall meet or exceed the minimum qualifications as prescribed in job descriptions established and maintained under the direction of the manager of Human Resources.

5.5 Nuclear Review Board (NRB)

The NRB shall have a documented Charter and Scope as follows:

- Provide policy guidance in areas involving nuclear and/or occupational safety, and surety of TRU WASTE HANDLING/disposal operations,

- Conduct formal reviews of activities or issues having nuclear/occupational safety or environmental significance.

5.6 Reportable Occurrence Action

Procedures shall be established, implemented, and maintained for the administration of reportable occurrence actions.

5.7 TSR VIOLATIONS

Any of the following constitutes a TSR VIOLATION: (1) failure to establish, implement, or maintain a TSR AC required program; (2) failure to establish, implement, or maintain a TSR AC required procedure; and (3) systematic failure to comply with TSR AC programs or procedures. A procedure containing the following components shall be established, implemented, and maintained for the reportingof TSR AC VIOLATIONS:

1. Placing the facility in the WASTE STORAGE/DISPOSAL MODE.

2. Reporting the VIOLATION in accordance with the above required reporting procedure.

3. Preparing a recovery plan describing steps that will reinstate compliance with the TSR AC.

4. Performing and documenting a technical evaluation, if appropriate, of the TSR AC VIOLATION to determine if an Unreviewed Safety Question exists.

5.8 Revisions to the TSR

All proposed changes to the TSR shall be submitted to the DOE for approval prior to implementation of the revision.

5.9 Programs

5.9.1 Configuration Control

A Configuration Control Program and associated procedures shall be established, implemented, and maintained to control designs, modifications, and procurement to ensure that the WIPP facility remains consistent with the design features assumed in the SAR.[2]

5.9.2 Document Control

A Document Control Program and associated procedures shall be established, implemented, and maintained to control WIPP documents. The program shall establish minimum review and approval requirements, change control, and minimum record retention requirements for the WIPP.

5.9.3 Maintenance

A Maintenance Program and associated procedures shall be established, implemented, and maintained to ensure that routine, corrective, and preventative maintenance, inspection, testing, and calibration activities are controlled.

5.9.4 Quality Assurance Program

A Quality Assurance Program and associated procedures shall be established, implemented, and maintained.

The basic elements of the Quality Assurance program should encompass, as applicable, work such as planning; training and personnel development; preparing, reviewing, approving, and verifying designs; qualifying suppliers; preparing, reviewing, approving, and issuing instructions, procedures, schedules, and procurement documents; purchasing; verifying supplier work; identifying and controlling hardware and software; manufacturing; managing and operating facilities; calibrating and controlling measuring and test equipment; conducting investigations and acquiring data; performing maintenance, repair, and improvements; performing assessments; and controlling records.

5.9.5 Procedures

Procedures shall be established, implemented, and maintained for WIPP TRU WASTE HANDLING and disposal related activities.

5.9.6 Training

A Training Program for the WIPP facility operation staff and technical support personnel shall be established and maintained.

5.9.7 Conduct of Operations

The Conduct of Operations program shall contain elements of organization and administration of facility operations to ensure that a high level of operations is achieved through effective implementation and control of operations activities.

Effective implementation and control of operating activities are primarily achieved through established written standards for operations, periodic monitoring and performance assessment, and holding personnel accountable for their performance.

The basic elements of the Conduct of Operations program should include, as applicable, guidance for: operations organization and administration; shift routines and operating practices; control area activities; communications; control of on-shift training; control of equipment and system status; lockouts and tagouts; independent verification; log keeping; operations turnover; timely orders to operators; operations procedures; operator aid postings; and equipment and piping labeling.

Preoperational checks shall be performed to ensure that WASTE HANDLING equipment (including waste hoist, and WHB 6-ton bridge crane) operate as required prior to WASTE HANDLING activities

5.9.8 Emergency Management

An Emergency Management Program and associated procedures shall be established, implemented, and maintained that provides preparedness, training, and operational response capabilities to minimize consequences to workers and the public from accidents involving WIPP operations.

5.9.9 Radiation Protection

A Radiation Protection program and associated procedures shall be established, implemented, and maintained to ensure personnel radiation protection for all operations involving personnel radiation exposure.

The basic elements of the Radiation Protection program, as specified in the WIPP Radiological Protection Plan should encompass, as applicable, the specifications of: policy considerations and general facility design features employed to maintain radiation exposures ALARA; radiological control zoning and access control; radiation shielding; ventilation systems; differential pressure; radiation monitoring equipment, and effluent monitoring and sampling systems.

5.9.10 WASTE Container Integrity

Procedures shall be established, implemented, and maintained to ensure WASTE container integrity from the time a WASTE container is no longer sealed inside an authorized transport package (DOT Type B) until it has been emplaced in the underground disposal area. Procedures shall also be established, implemented, and maintained to manage WASTE container integrity of site-derived mixed WASTE.

The basic elements of this program should include the following requirements:

- Transport packaging (TRUPACT-IIs) loaded with materials intended for disposal at the WIPP facility shall not be opened outside the designated WIPP Controlled Area (CA).

- WASTE containers loaded with materials intended for disposal at the WIPP shall not leave the

boundaries of the CA unless they are inside a sealed TRUPACT-II.

- CH WASTE containers {drums, boxes, or ten drum overpacks (TDOPs)} received at the WIPP for disposal shall be isolated from the normal disposal processing if they are found to exceed any of the following criteria:

  1) The removable surface contamination limits of the WIPP WAC[3]

  2) The surface contact dose rate limits of the WIPP WAC[3]

  3) A known or suspected breach of container integrity

  All containers failing these criteria will be dealt with in accordance with the following requirements.

- Decontamination in accordance with the Radiological Control Plan, shielding to below 200 mrem/hr contact dose rate, or sealing inside another container to meet the listed criteria (overpacking), as appropriate, shall be performed prior to returning the containers to the WASTE HANDLING process.

5.9.11 Criticality Safety

The Criticality Safety program is established by implementing the following criticality safety configuration requirements which apply at all times:

CH WASTE package configuration (including site-derived mixed WASTE):

- Fissile loading shall not exceed 200 grams per 55- or 85-gallon drum (WWIS).

- Fissile loading shall not exceed 325 grams per ten-drum overpack (TDOP) direct loaded with CH TRU waste.

- Fissile loading in WASTE boxes approximately equal to or greater in size than the TRUPACT-II SWB design shall not exceed 325 grams per box (WWIS).

- Drum arrays shall not exceed three drums high. Drum arrays may be infinite in the horizontal directions.

- Box arrays shall not exceed three boxes high. Box arrays may be infinite in the horizontal directions.

- WASTE drums shall be stacked only in the vertical position (longest dimension vertical).

- WASTE boxes shall be stacked only in the normal horizontal position (longest dimension horizontal).

Associated procedures shall be established, implemented, and maintained to ensure the prevention of accidental criticality at the WIPP facility.

5.9.12 WASTE Characteristics

A WASTE Characterization Program shall ensure that only WASTE that is compatible with the design, operation, and long-term performance of the WIPP facility are shipped to WIPP, and that any exceptions are weighed against all applicable baseline documents prior to their authorization for shipment.

Procedures shall be established, implemented, and maintained to ensure that the following WIPP WAC[3] requirements apply to all WASTE that is to be shipped to and/or emplaced at the WIPP are implemented:

- The WASTE accepted for placement in the WIPP facility must conform with the WIPP WAC[3] unless an exception to the WAC has been approved as a result of examination in relation to the SAR.[2] Site-derived mixed WASTE containers must also meet these requirements as they are packaged for disposal. Specific criteria used in the development of the safety analysis are as follows:

  - WASTE Containers
    1. Containers shall be noncombustible, and meet DOT Type A packaging requirements.
    2. Limit acceptable containers to 55-gallon drums, ten-drum overpacks, pipe containers in 55-gallon drums (pipe overpack containers), 85-gallon drum overpack, and standard WASTE boxes (SWBs).
    3. Removable surface contamination criteria shall be consistent with the requirements of the DOE Radiological Control Manual.

  - Liquids
    1. Liquid waste will not be accepted at the WIPP. Only residual liquids in well-drained internal containers are allowed. The aggregate amount of residual liquid is limited to less than 1 volume percent of the external container.

  - Pyrophoric Materials
    1. No non-radionuclide pyrophorics permitted. Radionuclides in pyrophoric form are limited to $< 1\%$ by weight in each WASTE package.

  - Explosives and Compressed Gases
    1. No explosives or compressed gases are permitted.

  - TRU Mixed WASTE
    1. TRU WASTE shall contain no hazardous WASTE unless they exist as co-contaminants with transuranics.
    2. Characteristic ignitable (D001), corrosive (D002), and reactive (D003) WASTE are not acceptable at WIPP.

  - Specific Activity of WASTE
    1. WASTE shall be greater than 100 nanocuries of TRU per gram of WASTE, exclusive of added shielding, rigid liners, and the WASTE containers, including alpha contaminated WASTE handled.

- Nuclear Criticality (Pu-239 FGE)
  1. Accepted package limits, including two times the error, are:
     a. < 200g/55- or 85-gallon drum
     b. < 325g/SWB
     c. < 325g/TDOP direct loaded with CH TRU waste

- Pu-239 Equivalent Activity

  Untreated WASTE
  1. ≤ 80 PE-Ci/55- or 85-gallon drum
  2. ≤ 130 PE-Ci/SWB
  3. ≤ 130 PE-Ci/TDOP direct loaded with CH TRU waste
  4. ≤ 1,100 PE-Ci/55-gallon drum overpacked in SWB, 85-gallon drum, or TDOP; or SWB overpacked in TDOP

  Solidified/Vitrified WASTE
  1. ≤ 1,800 PE-Ci/55-gallon Drum

  Pipe Overpack Container
  1. ≤ 1,800 PE-Ci/pipe overpack container

- Surface Dose Rate
  1. WASTE containers shall not exceed 200 mrem/hr surface reading.

- Gas Generation
  1. All WASTE containers shipped shall be vented with one or more filters.

- Data Package/Certification
  1. A data package with certification shall be transmitted prior to shipment.

- In addition to the SAR, all exceptions shall be evaluated against the WIPP facility Operational, Health, and Safety Requirements; the Final and Supplemental Environmental Impact Statements; agreements with the state of New Mexico; the Performance Assessment; RCRA requirements; and any applicable regulations before approval to ship is granted.

- Radioactive mixed WASTE to be emplaced at WIPP shall be managed in accordance with the applicable requirements of the RCRA Part B Permit issued by the state of New Mexico.

5.9.13 Unreviewed Safety Questions

An Unreviewed Safety Question program and associated procedures shall be established, implemented, and maintained that maintains the facility consistent with the SAR and design features.

5.9.14 Geotechnical Monitoring

A geotechnical monitoring program shall be established, implemented, and maintained to characterize, monitor, and trend salt behavior that might result in a roof fall in open WASTE disposal panels or rooms in the underground, so that remedial actions may be formulated as deemed necessary.

6 References

1 DOE Order 5480.22, Technical Safety Requirements, September 15, 1992.

2 WIPP Safety Analysis Report, DOE/WIPP 2065.

3 WIPP-DOE-069, Waste Acceptance Criteria for the Waste Isolation Pilot Plant, Rev. 5, February, 1996.

Table 5-1, Summary of Applicability of Defense-In-Depth SSCs to WIPP MODEs

Defense-In-Depth SSCs	WASTE HANDLING MODE		WASTE STORAGE/DISPOSAL MODE	
	WHB	Underground	WHB	Underground
WHB HVAC System	X		X*	
WASTE Hoist (when required to transport WASTE)	X	X		
WASTE HANDLING equipment (including the WHB TRUDOCK Bridge Crane, forklifts, facility pallets, underground transporters, etc.) as required during WASTE HANDLING operations only)	X	X		
WHB structure including tornado doors	X		X*	
Underground Ventilation and Filtration System		X		X
Radiation Monitoring System (active waste disposal room exit alpha CAM for underground shift to filtration)		X		X
Central Monitoring System to support underground shift to filtration		X		X

*Note that no defense-in-depth operational requirements apply to the WHB when no WASTE is present.

Following failure of a required SSC, the facility will be placed in the WASTE STORAGE/DISPOSAL MODE. During the time required to effect the required repairs, the facility is not in violation of the TSR.

APPENDIX A BASES

This appendix is utilized to provide summary statements of the reasons for the OPERATIONAL LIMITS and the associated SRs. No OPERATIONAL LIMITS or associated SRs have been identified for the WIPP. Accordingly, no BASES statements are presented in this appendix.

APPENDIX B DESIGN FEATURES

The provisions of the DESIGN FEATURES are present in the DOE-approved WIPP SAR[2] , Chapter 4. As stated in DOE Order 5480.22, Attachment 1, paragraph 2.6, this DESIGN FEATURES appendix is not needed.